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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Claire BESSET-BATHIAS

Appln. No.: 09/429,028

Confirmation No.: 5444

Filed: October 29, 1999

Docket No: Q56456

Group Art Unit: 2664

Examiner: Chirag G. SHAH

For: A METHOD FOR GENERATING ATM CELLS FOR LOW BIT RATE APPLICATIONS

SUBMISSION OF APPEAL BRIEF

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an Appeal Brief. A check for the statutory fee of $500.00 is attached. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,

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Date: September 23, 2005

Attorney Docket No.: Q56456

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For: A METHOD FOR GENERATING ATM CELLS FOR LOW BIT RATE APPLICATIONS

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

MAIL STOP APPEAL BRIEF - PATENTS
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P.O. Box 1450
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Sir:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellant submits the following:

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I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Alcatel. Assignment of the application was submitted in U.S. Patent and Trademark Office on October 29, 1999, and recorded on the same date at Reel 010356, Frame 0173.

II. RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences that will affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 14-24 are all of the claims pending in the application. Pending claims 14-24 are rejected, and are the subject of this appeal. All of the claims are set forth in the attached Appendix.

IV. STATUS OF AMENDMENTS

No amendments were requested subsequent to the Final Office Action of December 29, 2004.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The present invention is directed to a method and device for generating ATM cells for low bit rate connections having different priorities.

Independent method claim 14 recites:

> scheduling transmission times for ATM cells in a way that as long as there is data available from at least one of a plurality of low bit rate connections, the transmission times are spaced according to a cell rate negotiated for a corresponding ATM connection; and
>
> multiplexing the low bit rate connections into the ATM connection so that the ATM cells are transmitted at scheduled transmission times.

According to the present invention, streams of CPS packets (for example, two streams) are multiplexed into an ATM connection, wherein a first stream of CPS packets CPS_0 corresponds to real time, or high priority, traffic (for example, speech traffic) and a second stream of CPS packets CPS_1 corresponds to non real time, or low priority, traffic (for example, data traffic or signaling).

As shown in Figure 1, when CPS packets from the streams CPS_0 or CPS_1 arrive, they are stored in a common buffer CB and a pointer 2_0 or 2_1 to the CPS packet or address @ of the CPS packet in the common buffer CB is inserted in a corresponding FIFO memory, or linked list, LL_0 or LL. The linked list LL_o contains all the addresses of high priority CPS packets competing for packing into ATM cells and the linked list LL_1 contains all the addresses of low priority CPS packets competing for packing into ATM cells. A computation means 3 determines new value of sum of length indicators SLI_0 and SLI_1 indicating a sum of the lengths of all CPS packets of linked lists LL_0 and LL_1 by adding length Lli of the received CPS packet.

At each scheduled cell transmission time AST, linked lists LL_0 and LL_1 are served according to their respective priority and an ATM cell is filled accordingly. In other words, every ATM cell scheduled transmission time, multiplexing means 8 maps the selected octets into ATM cells according to the following rules. After each ATM cell is sent, if at least one of the two lists is not empty, a new cell transmission time AST is scheduled. The new scheduled cell transmission time AST may be determined as AST = AST + T, where T is the cell rate negotiated for the corresponding ATM connection.

If SLI_0 47 octets (i.e., if SLI_0 number of octets of an ATM cell payload), the addresses in the common buffer of the first received 47 octets of high priority are read in linked list LL_0, the common buffer CB is "emptied" from these 47 first octets, SLI_0 is set to SLI_0- 47, and these octets are mapped into an ATM cell without padding.

If $SLI_0 < 47$ octets (with $SLI_0 = x$), the addresses in the common buffer of the "x" first received octets of high priority are read in linked list LL_0, the common buffer CB is "emptied" from these "x" octets, and SLI_0 is set to zero. Further, if $SLI_1 = 0$, i.e. if there are no low priority packets to fill the cell, these "x" octets are mapped into the ATM cell and padding is used in this case to fill the cell. If $SLI_1 > 0$ and SLI_1 47-x, the addresses in the common buffer of the first 47-x received octets of low priority are read in linked list LL_1, the common buffer CB is "emptied" from these octets, SLI_1 is set to SLI_1 =SLI1-(47-x), and these "x" and 47-x octets are mapped into the ATM cell without padding. If $SLI_1 > 0$ and $SLI_1 < 47$-x (with $SLI_1 = y$), the common buffer is emptied from the corresponding "y" octets, SLI_1 is set to 0, and these "x" and "y" octets are mapped into the ATM cell and padding is used to fill the rest of the cell.

In another embodiment shown in Figure 2, intra priority multiplexing is carried out at ATM Adaptation Layer (AAL) level, and the inter-priority multiplexing is carried out at ATM Layer level. The method illustrated in Figure 2 differs from the one illustrated in Figure 1 in that two types of ATM cells are created by intra-priority multiplexing (i.e. by multiplexing of CPS packets of the same priority) each type corresponding to a type of traffic priority, and these two types of ATM cells are multiplexed into an ATM connection at ATM layer level. A first type of ATM cells ATM_{n0} corresponds to high priority traffic, and a second type of ATM cells ATM_{n1} corresponds to low priority traffic. The ATM cells ATM_{n0} and ATM_{n1} are formed using queuing means 5_0 and 5_1 and multiplexing means 9_0 and 9_1 that do not apply any traffic priority criteria, respectively. The ATM cells ATM_{n0} and ATM_{n1} are multiplexed at the ATM layer level uses queuing means 6_0 and 6_1 by multiplexing means 7 that do apply traffic priority criteria.

Apparatus claims 22-24 recite elements in means-plus-function format. In particular, claims 22-24 recite:

> means for scheduling transmission times for ATM cells in a way that as long as there is data available from at least one of a plurality of low bit rate connections, the scheduled transmission times are spaced according to a cell rate negotiated for a corresponding ATM connection (page 7, lines 11-12; Fig. 1, element 3); and
>
> means for multiplexing the low bit rate connections into the ATM connection so that the ATM cells are transmitted at scheduled transmission times (page 6, lines 1-4; Fig. 1, element 8; Fig. 2, element 7).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Claims 14 and 20-24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Petersen et al. (USP 5,802,051; hereafter "Petersen") in view of Subbiah et al. (USP 6,538,992; hereafter "Subbiah").

B. Claims 15-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Petersen in view of Subbiah and Depelteau et al. (USP 6404,767; hereafter "Depelteau").

C. Claim 19 is rejected under U.S.C. § 103(a) as being unpatentable over Petersen in view of Subbiah and Gritton (USP 5,940,397).

VII. ARGUMENT

A. Rejection of claims 14 and 20-24 under 35 U.S.C. § 103(a) as being unpatentable over Petersen in view of Subbiah

It is respectfully submitted that claims 14 and 20-24 would not have been rendered obvious in view of Petersen and Subbiah.

Independent claim 14 is directed to "[a] method for generating ATM cells for low bit rate applications". Claim 14 recites:

> scheduling transmission times for ATM cells in a way that as long as there is data available from at least one of a plurality of low bit rate connections, the transmission times are spaced according to a cell rate negotiated for a ~~the~~ corresponding ATM connection; and
>
> multiplexing the low bit rate connections into the ATM connection so that the ATM cells are transmitted at scheduled transmission times.

Independent claims 22-24 recite limitations similar to claim 14 but in apparatus format.

Although Examiner concedes that Petersen fails to disclose "the ATM cell transmission times are spaced according to a cell rate negotiated for the corresponding ATM connection", the Examiner asserts that it would have been obvious to modify Petersen based on Subbiah to include this feature of the claimed invention "in order to control delay and improve efficien[cy] and bandwidth usage for the ATM cell transmissions."[1]

Appellant respectfully submits that neither Petersen nor Subbiah teaches or suggests that "the ATM cell transmission times are spaced according to a cell rate negotiated for the corresponding ATM connection", as claimed, and one ordinary skill in the art would not have

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[1] December 29, 2004 Office Action at page 4.

been motivated to modify Petersen based on Subbiah to include this feature of the claimed invention.

Similar to the conventional method discussed on pages 1 and 2 of the present application, Subbiah teaches a method of scheduling transmission times of ATM cells based on a timer delay wherein ATM cells are sent both (1) before expiration of the delay time, i.e., when the cell is completely filled with packets or the packets has a stringent Quality of Service (QoS) requirement, and (2) at the expiration of the delay time thereby introducing delay variations in ATM cell spacing.

As discussed at column 3, lines 43-59 of Subbiah:

- if a user has requested a stringent delay (i.e. no delay), a packet belonging to this user will be transmitted immediately on the ATM connection;

- if a user has specified a delay, e.g. 4 ms of packing time, then a packet belonging to this user will be retained in a ATM cell only 4 ms before being transmitted.

Accordingly, Subbiah teaches that for the ATM connection (on which the packets belonging to these users are multiplexed), the ATM cells will not be spaced according to a cell rate negotiated for this ATM connection. Instead, depending on the QoS requested by the users, sometimes there may be, for example, no delay, or sometimes there may be for example a delay of 4 ms, etc.

Furthermore, the AAL2 Negotiation Procedure (ANP) mentioned in Subbiah is a negotiation procedure at AAL2 level which takes into account the QoS requirements for the CPS packets of each individual user, i.e., for each "low bit rate connection". On the contrary, the negotiation referred to in the claims of the present application is a negotiation at ATM level, i.e., at the level of the ATM connection on which a plurality of low bit rate connections is multiplexed.

Indeed, the negotiated cell rate specified in the claims is a cell rate negotiated for the corresponding ATM connection.

Thus, Subbiah teaches ATM cell transmission is variably spaced according to the negotiated cell rate (i.e., QoS) of the CPS packets at AAL2 layer and fill level of the ATM cell.

In the December 29, 2004 Office Action, the Examiner cites claim 1 of Subbiah for allegedly disclosing "scheduling transmission times for ATM cells in a way that as long as there is data available from at least one of a plurality of low bit rate connections, the transmission times are spaced according to a cell rate negotiated for a corresponding ATM connection." In particular, the Examiner asserts:

> [claim 1 of Subbiah discloses that] if the QoS/cell rate negotiated is CBR (as described in col. 7, lines 59-67 and claim 1), the ATM cells with common QoS requirement are queued into one queue, and then multiplexed and then are transferred (claim 1) and spaced (according to the QoS requirement) for a corresponding connection from a local peer entity to the remote peer entity. Thus, the transmission times for packets (each ATM cell) are spaced (constantly) according to the CBR negotiated for a corresponding connection as long as there is data available from one low bit rate connection. Thus, Subbiah discloses and/or suggest the claimed limitation.[2]

Accordingly, it appears that the Examiner is confusing spacing of the packets with the transmission times of the ATM cells. That is, although the packets are inserted into the ATM cell based on the QoS requirements of packets, the ATM cells will not be spaced according to a cell rate negotiated for the ATM connection. Instead, the ATM cells will be transmitted a different

[2] December 29, 2004 Office Action at pages 8 and 9.

times which vary based on how long it takes to fill the ATM cells with packets awaiting transmission and the QoS requirements for the different packets.

In the June 15, 2005 Advisory Action, the Examiner asserts that "Subbiah et al reads on the claim subject matter, in a scenario where [an] ATM cell contain[s] a single packet and at the expiration of the delay timer, the cell will be transmitted with the single packet and if the scenario repeats then the delay set of QoS corresponds to the ATM cell rate." However, Appellant respectfully submits that the Examiner's position is incorrect since the QoS in the Examiner's proposed scenario does not correspond to cell rate negotiated for the corresponding ATM connection. As explained above, the AAL2 Negotiation Procedure (ANP) mentioned in Subbiah is a negotiation procedure at AAL2 level which takes into account the QoS requirements for the CPS packets of each individual user, i.e., for each "low bit rate connection". On the other hand, the claims require that the negotiated cell rate mentioned in the claims is a cell rate negotiated for the corresponding ATM connection, i.e., at the level of the ATM connection on which a plurality of low bit rate connections are multiplexed.

In view of above, Appellant respectfully submits that claims 14 and 20-24 should be allowable because the cited references, alone or combined, do not teach or suggest all of the features of the claimed invention, and one of ordinary skill in the art would not have been motivated to combine and modify the cited references to produce the claimed invention.

B. Rejection of claims 15-18 under 35 U.S.C. § 103(a) as being unpatentable over Petersen in view of Subbiah and Depelteau

Appellant respectfully submits that Depelteau does make up for the above noted deficiencies of Petersen and Subbiah. Accordingly, Appellant respectfully submits claims 15-18 should be allowable over the cited references at least by virtue of its dependency on claim 14.

C. Rejection of claim 19 under U.S.C. § 103(a) as being unpatentable over Petersen in view of Subbiah and Gritton

Appellant respectfully submits that Gritton does make up for the above noted deficiencies of Petersen and Subbiah. Accordingly, Appellant respectfully submits claim 19 should be allowable over the cited references at least by virtue of its dependency on claim 14.

Unless a check is submitted herewith for the fee required under 37 C.F.R. §41.37(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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CLAIMS APPENDIX

CLAIMS 14-24 ON APPEAL:

Claims 1-13 (Canceled)

14. (Previously Presented) A method for generating ATM cells for low bit rate applications, said method comprising:

scheduling transmission times for ATM cells in a way that as long as there is data available from at least one of a plurality of low bit rate connections, the transmission times are spaced according to a cell rate negotiated for a corresponding ATM connection; and

multiplexing the low bit rate connections into the ATM connection so that the ATM cells are transmitted at scheduled transmission times.

15. (Previously Presented) The method according to claim 14, wherein said cell rate is a Peak Cell Rate PCR in the case of service category of DBR, or Deterministic Bit Rate, or CBR, or Constant bit Rate, type.

16. (Previously Presented) The method according to claim 14, wherein said cell rate is a Block Cell Rate BCR in the case of service category of ABT, or ATM Block Transfer, type.

17. (Previously Presented) The method according to claim 14, wherein said cell rate is an Allowed Cell Rate ACR in the case of service category of ABR, or Available Bit Rate, type.

18. (Previously Presented) A method according to claim 14, wherein said cell rate may be re- negotiated.

19. (Previously Presented) The method according to claim 14, wherein no ATM cell is sent when there is no data available from any of said low bit rate connections, and said method includes a further step of referencing said scheduling step with respect to the next availability of data from at least one of said low bit rate connections.

20. (Previously Presented) The method according to claim 14, wherein said low bit rate connections are assigned different priorities, and said multiplexing step includes an intra-priority multiplexing for multiplexing low bit rate connections of the same priority, and an inter-priority multiplexing for multiplexing low bit rate connections of different priorities.

21. (Previously Presented) The method according to claim 20, wherein said intra-priority multiplexing and said inter-priority multiplexing are both carried out at ATM Adaptation Layer level.

22. (Previously Presented) A device for generating ATM cells for low bit rate applications, said device comprising:

means for scheduling transmission times for ATM cells in a way that as long as there is data available from at least one of a plurality of low bit rate connections, the scheduled transmission times are spaced according to a cell rate negotiated for a corresponding ATM connection; and

means for multiplexing the low bit rate connections into the ATM connection so that the ATM cells are transmitted at scheduled transmission times.

23. (Previously Presented) A base station for a mobile radio communication network, comprising a device for multiplexing low bit rate traffic from a plurality of sources into a same ATM connection for transmission to a base station controller, said device comprising:

means for scheduling transmission times for ATM cells in a way that as long as there is data available from at least one of a plurality of low bit rate connections, the scheduled transmission times are spaced according to a cell rate negotiated for a corresponding ATM connection and in a way as to keep ATM cell spacing as constant as possible; and

means for multiplexing the low bit rate connections into the ATM connection so that the ATM cells are transmitted at the scheduled transmission times.

24. (Previously Presented) A base station controller for a mobile radio communication network, comprising a device for multiplexing low bit rate traffic from a plurality of sources into a same ATM connection, for transmission to a base station, said device comprising:

means for scheduling transmission times for ATM cells in a way that as long as there is data available from at least one of a plurality of low bit rate connections, the scheduled transmission times are spaced according to a cell rate negotiated for a corresponding ATM connection; and

means for multiplexing the low bit rate connections into the ATM connection so that the ATM cells are transmitted at the scheduled transmission times.

EVIDENCE APPENDIX:

There has been no evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 or any other similar evidence.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings.